Compact disc mechanism CDM-2/0414

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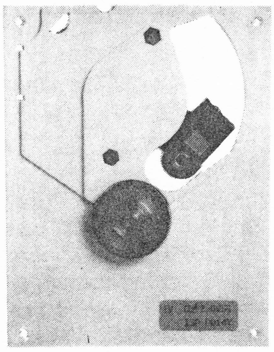

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Service Manual

COMPACT
disc
DIGITAL AUDIO

CONTENTS

1. Table of contents and explanation of the layout.
2. Technical specification
3. Servicing hints
4. Measurements and adjustments
5. Exploded views and parts list of mechanical components

CLASS 1
LASER PRODUCT
3122 110 03420

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

Documentation Technique Service Dokumentation Documentazione di Servizio Huolte-Ohje Manual de Servicio Manual de Serviçio

Subject to modification

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1. EXPLANATION OF THE LAYOUT OF THE DOCUMENTATION

This documentation consists of chapters.
The number of the chapter is indicated by the first digit of the page number.
The second digit of the page number is the sequence numbering.

If modifications or supplements require new supplementary or replacement pages, the page number is extended with a third part:
A digit behind the page number indicates that it concerns a supplementary page.
A replacement page is indicated by a letter behind the page number.

Example:
3-6 is page 6 of chapter 3
3-6-1 is a supplementary page behind page 3-6
3-6-a is the replacement page of page 3-6 (so page 3-6 can be taken out of the documentation).

CHAPTER	**PAGE**	**CONTENTS**
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2. TECHNICAL DATA

General

- Application: Compact Disc "Home Player"
- Operating position: Vertical (± 10°)
- Single–stage radial and balanced actuator for track following
- Track following error detection method : Push–Pull
- Focus error detection method : Double Foucault
- DC turntable motor with permanent magnets
- Dimensions: 130 x 100 x 44 mm
- Weight : abt. 270 grams

Radial actuator

- Swing angle: 72°
- Diameter readout range: from 47.4 mm ± 0.6 mm to 117.5 mm ± 0.5 mm
- Squareness relative to turntable: 90° ± 0.3°
- Bearing friction: 0.75 mNm
- Total ohmic resistance of the coils: 10 Ω ± 0.6 Ω
- Maximum allowable voltage: 14V/DC continuous
- K factor: 0.025 Nm/A (± 20%)

Focus actuator

- Vertical amplitude: 1.9 mm ± 0.2 mm
- DC voltage across the focus motor in focus: between –0.8V and +0.7V.
- Sensitivity: 13 mm/A
- Ohmic resistance: 23.5 Ω ± 2.5Ω
- Maximum allowable voltage: 8V/DC continuous

Laser diode LTO 22MC

- Wave length: 780 nm ± 10 nm
- Light energy: 3 mW
- Voltage across the diode at 3mW: typical = 1.75 V, max. = 2.2 V

Turntable motor

- Sense of rotation: CW (clockwise)
- Nominal voltage: 2.2 V/DC
- Nominal speed: 210...600 rpm.
- Total ohmic resistance rotor: 16 Ω ± 1.6 Ω
- Maximum allowable voltage: 12V/DC

3. SERVICING HINTS

To prevent loose metal objects from getting in the CD mechanism, it will be necessary to see to a clean repair station.

The objective can be cleaned with a blow brush.

When effecting repairs to, or making measurements on the CD mechanism, be careful not to damage the flat springs of the focusing unit.

THE PHOTODIODES AND THE LASER ARE MORE SENSITIVE TO ELECTROSTATIC DISCHARGES THAN MOS ICS.
CARELESS HANDLING DURING SERVICING MAY REDUCE LIFE EXPECTANCY DRASTICALLY.
FOR THIS REASON CARE SHOULD BE TAKEN THAT DURING SERVICING THE POTENTIALS OF THE AIDS AND YOURSELF ARE EQUAL TO THAT OF THE SCREENING OF THE SET.

For measurements and adjustments it is possible to position the working mechanism outside the set.
For this purpose, an extension cable can be made from the following parts.

- Service flat cable (14-pole)	4822 322 40066
- Service connector (14-pole)	4822 290 60602

These two items should be used to assemble an extension cable between the connector and the flex cable of the CDM-2 unit.
The two connections to the motor should be lengthened with loose wires.

Remark: The service cable should be assembled as follows; (see Fig. 1)

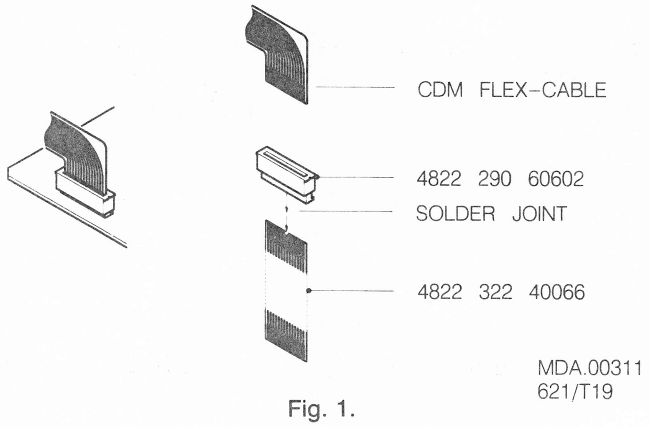


Fig. 1.

Service aids

Audio test disc	4822 397 30085
Disc without errors + Disc with DO errors, black spots and fingerprints	4822 397 30096
Disc hold-down	4822 532 51755
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
Glass disc	4822 395 90204

Demounting the Rafoc unit

- Take the CD-mechanism out of the set.
  (For the demounting instructions see the service manual of the set).
- Remove the flexible PCB from the connector on the PCB by lifting the upper part of the connector and taking the flexible PCB out. (see Fig. 2)

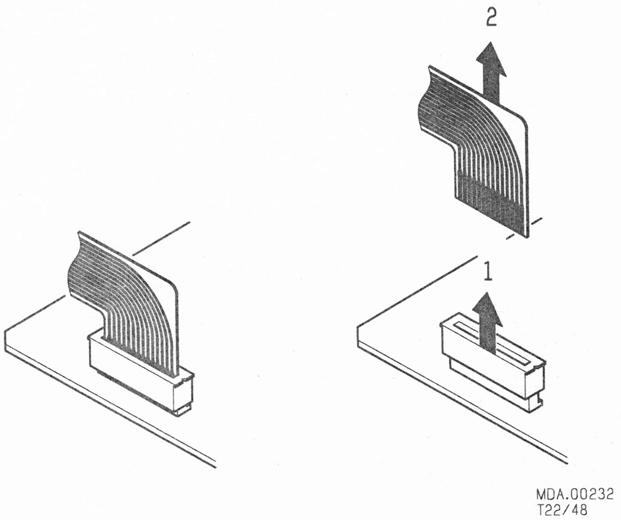


Fig. 2

- The RAFOC unit can be removed after the two fixing screws M3 × 25 have been loosened.
  Caution: when doing so, the two nuts M3 on the upper side of the CD mechanism come loose.
- Now the pivot plate, item no. 56, can be removed.
- After removing the clamping piece, item no. 51, the RAFOC unit/flexible PCB assembly can be taken out.
  Attention: when mounting the RAFOC unit, see to it that the flexible PCB reset well against the mounting plate at the height of the clamping piece (item no. 51).
  In some cases, after exchanging the RAFOC unit/flexible PCB assembly, it may be necassary to glue the flexible PCB with a fast-drying glue to prevent the RAFOC unit from rubbing against the flexible PCB. The glueing should be done very carefully.
- When the laser and/or the monitor diodes are defective, it will be necessary to replace the CDM unit.
- After mounting the RAFOC unit you should make sure that the arm runs clear over the entire disc diameter. This can be checked by means of a spring-pressure gauge which is held against the magnet of the focusing unit.
  The friction of the arm, measured over the entire meter reading, may not be greater than 25mN.
- A fast check of the clearance of the arm is possible in service position 0.
  For servicing positions see the service manual of the set.
- After mouning, the angle setting should be adjusted.

Replacing the flexible PCB item 54

- Demount the RAFOC unit.
- Desolder the connections A (see Fig. 3) of the flexible PCB.

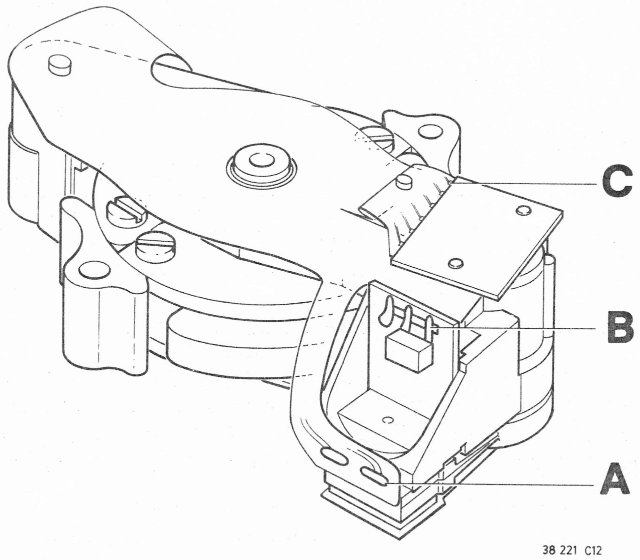


Fig. 3

- Before desoldering the connections C of the photodiode PCB, the positions of the connecting points of the photodiode PCB should be marked, so that afterwards the PCB can correctly be replaced.
- Now the 6 connections C of the photodiode PCB can be desoldered by heating the pins C one by one until the flexible PCB comes loose.
  This should be done very carefully.
- Desolder the 4 connections of the radial coils.

Mounting the flexible PCB (item 54).

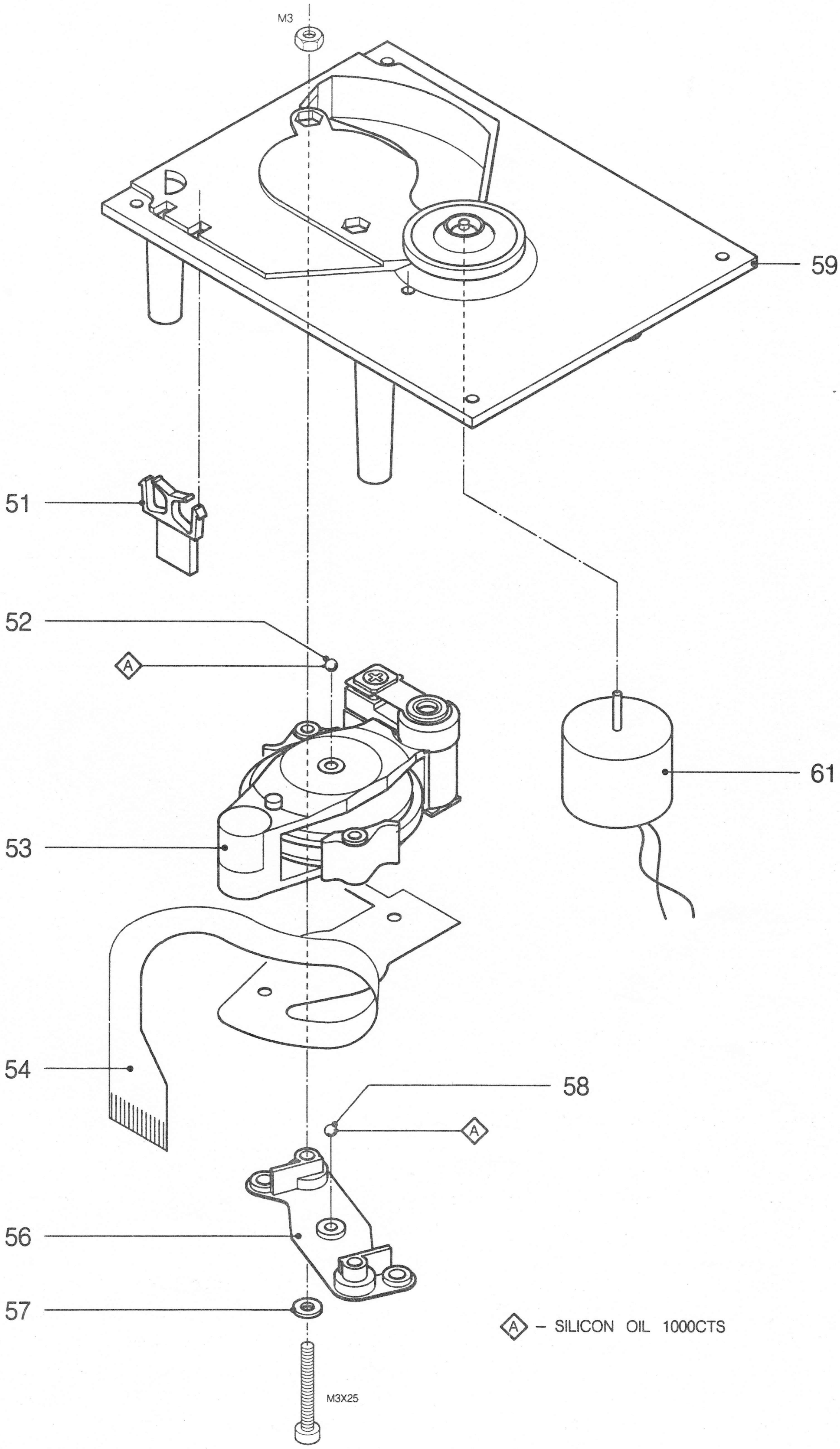
- Solder the 4 connections of the radial coils.
- Apply the connections A and B (see Fig. 3).
- Before the 6 connections of the photodiode PCB can be soldered, they should be provided with an extra coating of tin.
- Place the flexible PCB under the photodiode PCB.
- In order to hold this position, the flexible PCB may be supported (for example by an expanded paper-clip between the arm and the underside of the flexible PCB).
- Then the 6 connections C can be heated so that they become soldered to the photodiode PCB.

Replacing electrical components

- If one of the following components is defective: photodiodes, laser diode, focus motor, radial actuator turntable motor, the entire CDM unit should be replaced.

EXPLODED VIEW

CDM 2



Mechanism parts

Complete unit	4822 691 30201 (Pos. 51÷61)
51	4822 492 63761
52,58	4822 520 40177
54	4822 323 50124
56	4822 520 10555
57	4822 530 80188
A	4822 390 80145

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4. MEASUREMENTS AND ADJUSTMENTS

Checking the angle setting

The angle setting can be checked with the glass-disc method which is explained below.

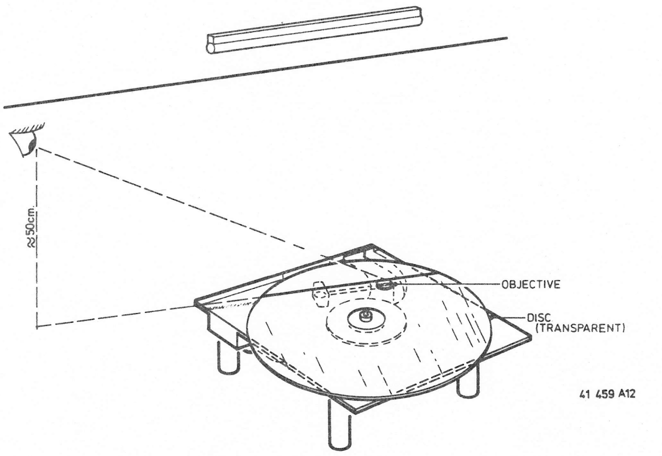

Fig. 4

Put glass disc 4822 395 90204 on the turntable.
Make sure that the glass disc beds down well on the turntable.
Place the CD mechanism under a light source, under which there is a straight line (e.g. under a fluorescent tube with grid).
Set the arm to mid-position of its radial track.
Turn the mechanism until the arm is parallel to the line under the light source (see figure below).
Look into the direction and in the extension of the line to the reflection there of on the glass disc and in the objective.
Locate the CDM in such a way that the line reflected by the glass disc runs across the centre of the objective.
The line reflected by the objective should fall just within the surface of the objective. If this is the case, the two lines are not more than 4 mm apart and squareness is correct.

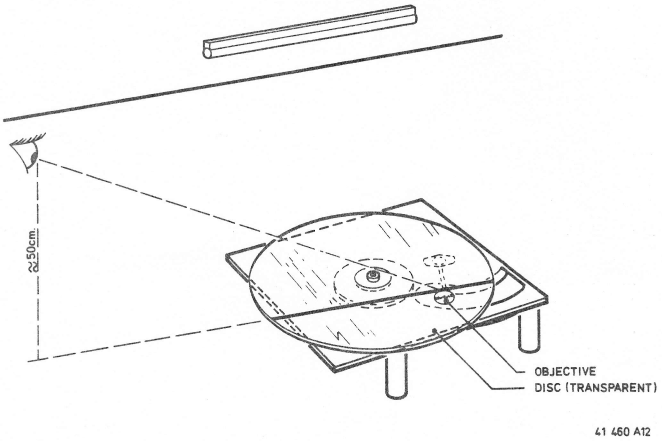

Fig. 5

Turn the CD mechanism through 90° relative to the previous position. The arm must be kept in mid-position (see figure above).
Repeat the previous check.

Adjusting the angle setting

For adjusting the angle settig one or both of the two locking knocks for the bearing plate on pos. 59 must be broken.
If a check on the angle setting shows that the angle falls outside the tolerance, the angle should NOT be adjusted for minimum deviation, but it should be adjusted within the tolerance.
The new setting should lie between the old setting and the optimum setting. After adjusting the setting, the friction of the arm must be checked. This is done by means of a spring pressure gauge which is held against the magnet of the focusing unit.
The friction of the arm, measured over the entire meter reading, should not be greater than 25 mN.
When the friction appears to be too high, the RAFOC unit must be replaced and the angle between disc and light path adjusted.

The lock is adjusted as follows:

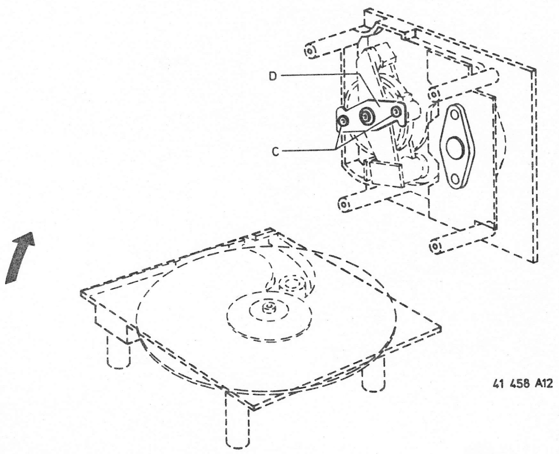

Fig. 6

Loosen screws C (see figure above) unitl bearing plate D can be displaced. Correct the angle setting by moving the bearing plate into the direction shown in figure below.
Tighten screws C, ensuring that the setting does not drift.
Then double check the setting in two directions.

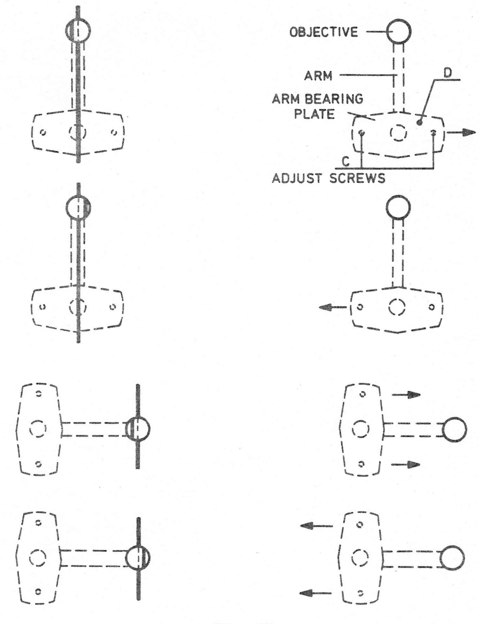

Fig. 7

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